Virginia Center for Health Statistics

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HEALTHY VIRGINIA

INSIDE THIS ISSUE:

MAJOR CHANGES IN MORTALITY REPORTING FOR 1999 DATA

There will be two major changes which impact mortality data reporting beginning with deaths occurring on and after January 1, 1999. One change impacts the mechanism for coding and classifying the underlying cause of death. The second changes the calculation of age-adjusted death rates. Both will need to be understood when producing and interpreting trends compared with mortality data from previous years.

ICD-10

For the past two decades mortality data have used the *International Classification of Diseases, Ninth Edition* (ICD-9) developed by the World Health Organization. Commencing with deaths on and after January 1, 1999, mortality coding switched to the Tenth Edition of this publication (ICD-10). This change has three components:

Codes – The codes have changed from a numeric to an alphanumeric structure. The number of codes has increased from approximately 5,000 to almost 10,000. This increase permits a much more detailed classification.

Rules – The rules used to identify the underlying cause of death from the multiple causes listed on the death certificate have been revised. The intent of this change was to focus attention away from complications to the condition that may be impacted by public health efforts.

Reporting – The aggregation of codes into cause of death tables have changed. In the past the Center published a set of 64 causes in our Annual Reports (HIV/AIDS and Alzheimer's Disease were added to this list during the decade). For ICD-10, we are exploring the use of a 113 cause, a 52 cause and/or a 39 cause table listing. As an example, Figure 1 displays a proposed 39 cause table.

Comparablity Ratios are used to measure the impact of changing coding structures. The mechanism is to code a set of death records using both ICD-9 and ICD-10, comparing the results and calculating a ratio to represent the extent of the changes' impact. A Comparablity Ratio of 1.00 indicates no change between the two systems. A ratio of less than 1.00 indicates the disease or injury lost deaths under the new coding system. A ratio of more than 1.00 indicates the disease or injury gained deaths under the new system. Figure 2 shows the Comparability Ratios for several important causes of death.

The pneumonia and influenza grouping is expected to change significantly under ICD-10. Originally it was estimated that the comparability ratio for this item would be 0.37. In April 2000 the National Center for Health Statistics (NCHS) revised the ICD-10 rules retroactively to January 1999 to mitigate some of this change. As a result, the comparability ratio is now estimated to be 0.70.

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FIGURE 1 – PROPOSED 39 CAUSES OF DEATH TABLE

Cause of Death Grouping	ICD-10 Codes Included
1) Tuberculosis	A15-A19
2) Syphilis	A50-A53
3) Human Immunodeficiency Virus (HIV) Disease	B20-B24
Malignant Neoplasms	**C00-C97**
4) Stomach	C16
5) Colon, Rectum, and Anus	C18-C21
6) Pancreas	C25
7) Trachea, Bronchus, and Lung	C33-C34
8) Breast	C50
9) Cervix Uteri, Corpus Uteri, and Ovary	C53-C56
10) Prostate	C61
11) Urinary Tract	C64-C68
12) Non-Hodgkin's Lymphoma	C82-C85
13) Leukemia	C91-C95
14) Other Malignant Neoplasms	C00-C15,C17,C22-C24C26-C32,C37-C49,C51-C52, C57-C60,C62-C63,C69-C81,C88,C90,C96-C97
15) Diabetes Mellitus	E10-E14
16) Alzheimer's Disease	G30
Major Cardiovascular Diseases	**I00-I78**
Diseases of Heart	**I00-I09,I11,I13,I20-I51**
17) Hypertensive Heart Disease With or Without Renal Disease	I11,I13
18) Ischemic Heart Diseases	I20-I25
19) Other Diseases of Heart	I00-I09,I26-I51
20) Essential Hypertension and Hypertensive Renal Disease	I10,I12
21) Cerebrovascular Diseases	I60-I69
22) Atherosclerosis	I70
23) Other Diseases of Circulatory System	I71-I78
24) Influenza and Pneumonia	J10-J18
25) Chronic Lower Respiratory Diseases	J40-J47
26) Peptic Ulcer	K25-K28
27) Chronic Liver Disease and Cirrhosis	K70,K73-K74
28) Nephritis, Nephrotic Syndrome, Nephrosis	N00-N07,N17-N19,N25-N27
29) Pregnancy, Childbirth, and the Puerperium	O00-O99
30) Certain Conditions Originating in the Perinatal Period	P00-P96
31) Congenital Malformations, Deformations, Abnormalities	Q00-Q99
32) Sudden Infant Death Syndrome	R95
33) Symptoms, Signs, and Abnormal Clinical and Laboratory Findings Not Elsewhere Classified	R00-R94,R96-R99
34) All Other Diseases (Residual)	A00-A09,A20-A49,A54-B19,B25-B99,D00-E07, E15-G25,G31-H93,I80-J06,J20-J39,J60-K22,K29-K66,K71-K72,K75-M99,N10-N15,N20-N23,N28-N98
35) Motor Vehicle Accidents	V02-V04,V09.0,V09.2,V12-V14,V19.0-V19.2, V19.4-V19.6,V20-V79,V80.3-V80.5,V81.0-V81.1,V82.0-V82.1,V83-V86,V87.0-V87.8,V88.0-V88.8,V89.0,V89.2
36) All Other and Unspecified Accidents and Adverse Effects	V01,V05-V06,V09.1,V09.3-V09.9,V10-V11,V15-V18,V19.3, V19.8-V19.9,V80.0-V80.2,V80.6-V80.9,V81.2-V81.9,V82.2-V82.9,V87.9,V88.9,V89.1,V89.3,V89.9,V90-X59,Y40-Y86,Y88
37) Intentional Self-Harm (Suicide)	X60-X84,Y87.0
38) Assault (Homicide)	X85-Y09,Y87.1
39) All Other External Causes	Y10-Y36,Y87.2,Y89

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With each new version of ICD there has been a break in the trend lines for the major diseases to a greater or lesser extent. To properly interpret trend lines over time, the impact of changes in coding rules and structures must be included as part of the analysis.

For more information on ICD-10, including how to order copies of the ICD-10 publications, please refer to the World Health Organization web site at:

Http:// www.who.int/whosis/icd10

FIGURE 2 – COMPARABILITY RATIOS FOR SELECTED CAUSES OF DEATH.

Cause	Ratio	Cause	Ratio
Heart Disease	1.02	Chronic liver disease & cirrhosis	1.03
Malignant neoplasms	1.00	Nephritis, nephrosis, etc.	1.40
Cerebrovascular diseases	1.04	Septicemia	1.27
COPD	1.03	Alzheimer's disease	1.69
Accident	1.00	Homicide	1.04
Pneumonia & Influenza	0.70	Atherosclerosis	0.98
Diabetes mellitus	1.03	Congenital anomalies	0.86
HIV infection	1.05	Perinatal conditions	1.03
Suicide	0.99	SIDS	0.92

Source: National Center for Health Statistics – unpublished data (revised 04/00).

AGE-ADJUSTING STANDARD

Age-adjusting is a mechanism to remove the differences in population age demographics when comparing mortality rates between jurisdictions. For example, when examining deaths due to heart disease in two communities it is useful to know that the differences detected are due to the disease process rather than being confounded by differences in the age make-up of the communities. When comparing a community with a large retirement component to a community with a large number of young adults, is the difference in heart disease rates due to the population difference or is there an actual disease process difference? The age-adjustment tool utilizes a standard population set to remove the demographic difference so the user may focus on the disease process. It is important to note that age-adjusted rates have meaning only in comparison to other rates adjusted to the same standard. Also, it should be remembered that the best way to study mortality changes is to examine age-specific death rates.

Since 1943 the National Center for Health Statistics (NCHS) has used the projected 1940 US population as the standard for adjusting ages. To complicate matters, the projected 1970 US population has been used by some other government agencies to adjust cancer mortality data. To simplify the situation, the Department of Health and Human Services has chosen to move to one unified standard for all health programs. That standard is the projected 2000 US population. Effective with 1999 mortality data, this new standard will be used for calculating age-adjusted death rates for all causes.

Figure 3 lists the 1940 and 2000 US Standard Populations. The proportion of the standard population at or above age 65 doubles from 6.8% (1940) to 12.6% (2000). The proportion at or above age 85 increases more than five times from 0.3% (1940) to 1.6% (2000). The median age increases by about 6.5 years from 29.2 (1940) to 35.7 (2000).

The practical result of switching standards will be to increase the age-adjusted rate for most conditions and especially for chronic diseases associated with aging. Some of these will more than double. Figure 4 compares the crude and age-adjusted death rates using the 1940 and the 2000 standard population for several of the leading causes of death. Careful explanations and footnotes will be needed to prevent unnecessary concern when the public sees these much higher rates.

In reality, it does not matter which standard one uses for age-adjusting as long as the results are only compared to rates calculated using the same standard. The 1940 or the 1970 or the 2000 weights work equally well. Using the 2000 weights universally provides the benefits of comparability and simplicity. However, in the short run there may be some confusion as users will not be able to compare rates calculated with the 2000 standard to previously published rates using the older standards.

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FIGURE 3 – THE 1940 AND 2000 US STANDARD POPULATIONS

	1940		2000	
Age	Number	Weight	Number	Weight
All Ages	1,000,000	1.000000	1,000,000	1.000000
Under 1 year	15,343	0.015343	13,818	0.013818
1-4 years	64,718	0.064718	55,317	0.055317
5-14 years	170,355	0.170355	145,565	0.145565
15-24 years	181,677	0.181677	138,646	0.138646
25-34 years	162,066	0.162066	135,573	0.135573
35-44 years	139,237	0.139237	162,613	0.162613
45-54 years	117,811	0.117811	134,834	0.134834
55-64 years	80,294	0.080294	87,247	0.087247
65-74 years	48,426	0.048426	66,037	0.066037
75-84 years	17,303	0.017303	44,842	0.044842
85+ years	2,770	0.002770	15,508	0.015508

FIGURE 4 – CRUDE AND AGE-ADJUSTED DEATH RATES USING 1940 AND 2000 US STANDARD POPULATIONS FOR THE LEADING CAUSES OF DEATH, VIRGINIA RESIDENTS, 1998

	Rates per 100,000		
		Age Adjusted	
Cause of Death	Crude	1940	2000
All Causes	793.5	475.5	899.0
Heart disease	234.1	127.0	269.7
Malignant neoplasms	188.2	125.7	208.2
Cerebrovascular diseases	55.8	27.0	65.5
COPD	36.3	20.7	41.5
Unintentional Injury	33.5	27.0	35.3
Pneumonia & influenza	30.1	13.4	35.8
Diabetes mellitus	19.4	12.2	21.8
Suicide	12.2	11.1	12.2
Septicemia	11.5	6.5	13.2
Nephritis & nephrosis	11.2	5.9	13.0
Alzheimer's disease	8.2	3.1	9.9
Chronic liver disease	7.7	6.0	8.2
Homicide	6.2	6.3	6.0

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